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Research Implementation & Project Closure

Project Information	
(To be completed by WHRP staff when draft report is received) **Date completed:** March 20, 2007	
Project Title: Determination of Typical Resilient Modulus Values for Selected Soils in Wisconsin	**Project ID:** 0092-13-11
Technical Oversight Committee: Geotechnics	**TOC Chair:** Robert Arndorfer
Project Start Date: January 31, 2003	**WisDOT Project Manager:** Robert Arndorfer
Project End Date: May 31, 2006	**Approved Contract Amount:** $ 103,049.00
Final Report Dated: May 2006	**Actual Project Expenditures:** $ 103,049.00
Principal Investigator: Hani Titi **Organization:** University of Wisconsin-Milwaukee	**Co-investigators (including research assistants) and Organizations:** Mohammed B. Elias, Sam Helwany, UW-Milwaukee

Implementation / Further Research Recommendations

(Information provided by TOC and WisDOT project manager when final report is approved) **Date completed:** February 12, 2007

1. What WisDOT policy or practice does this research project pertain to? Please identify the specific section(s) of the Facilities Development Manual (FDM), Construction and Materials Manual (CMM), Standard Specifications, other manual, or accepted practice to which this research pertains.
FDM Chapter 14, Pavement Design.

2. Based on the results of this research, the following steps are recommended. (Please select either A, B or C, and provide detail in Items 3 to 7, below.)

☐ **A. No further activity is necessary. (Please skip to Item 7.)**

☒ **B. Revisions to WisDOT policy or practice are not appropriate at this time. However, to gain further value from this research, we recommend follow-up research and/or validation activities as detailed in 3 through 6, below.**

☐ **C. The Technical Oversight Committee recommends implementing changes to the following WisDOT policies or practices. (Please identify specific section(s) of specific manuals, where applicable):**

3. Describe the scope and objectives of follow-up research or implementation of specific changes to WisDOT procedures.
2008 RFP issued for text by same methodology of 12 to 18 additional samples of fine-grained and coarse-grained plastic soils.

4. Details of Follow-up Research or Implementation Activities:

Task	Person responsible	Target completion date
1.		
2.		
3.		
4.		

5. Estimated cost, if any, for equipment, training, printing, etc.:

6. Expected benefits and how they will be measured (dollar savings, time savings, etc.):
Next study will lead to reduced pavement materials cost, because more precise M-E input values will be used instead of present conservative inputs.

7. Reasons for terminating activities related to this research project:

Project Closure

(Information provided by principal investigator and WisDOT project manager when final report is approved)
Date completed: March 20, 2007

Timeline and budget

1. Was the project completed on time (i.e., per the original contract between WisDOT and the performing organization)?
☐ Yes
☒ No

1a. If not, what additional time was needed to complete the project?
From 1/31/2005 to 5/31/2006
What were the reasons?
☐ Data access ☐ Reporting/revision delay
☐ Testing delay ☐ Research subcontractor delay
☐ Construction delay ☒ Work plan modification
☒ Administrative delay

2. Was additional funding sought for this project?
☐ Yes
☒ No

2a. If yes, how much?
Was the funding approved? ☐ Yes ☐ No
For what purpose?

Partnerships and facilities

3. Did this research effort include partnerships with other universities, agencies, or other stakeholders?
☐ Yes
☒ No

3a. If yes, please list. Include the locations of any out-of-state institutions.

4. Indicate the location of facilities used:
☒ University
☐ Wisconsin DOT
☐ Other:

4a. Please describe the type of laboratory and testing facilities used.
Materials lab at UW-Milwaukee.

Student involvement

5. Were graduate students employed for this study?
☒ Yes
☐ No

5a. If yes, how many?
Number male 2
Number female

6. Did any of the graduate students use this research project in a published thesis or article?
☒ Yes ☐ Not sure
☐ No ☐ N/A

6a. Citations of published theses or articles:
Elias, M.B. and Titi, H.H. (2006). "Evaluation of Resilient Modulus Model Parameters for Mechanistic Empirical Pavement Design," Journal of the Transportation Research Board, No. 1967, Geology and Properties of Earth Materials 2006, Transportation Research Board, Washington, D.C., pp.89-100.

Elias, M.B., Titi, H.H., and Helwany, S. (2004) "Evaluation of Resilient Modulus of Typical Wisconsin Soils," Geotechnical Practice Publication No. 1, GeoJordan: Advances in Geotechnical Engineering with Emphasis on Dams, Highway Material, and Soil Improvement, American Society of Civil Engineers, pp. 335-346.

Elias, M.B., and Titi, H.H, S. (2005). "Effect of Sample Size on Resilient Modulus of Cohesive Soils," Proceedings of the 16th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMG), Osaka, Japan, Vol. 2, pp. 499-502. (September 2005)

7. Were undergraduate students employed for this study?
☒ Yes
☐ No

7a. If yes, how many?
Number male 1
Number female

8. If known, please list the graduate students' current occupations or affiliations (e.g., continuing graduate education, employed at a public agency or private firm, etc.) and completed degrees and awarding institutions.	**9. If known, please list the undergraduate students' current occupations or affiliations (e.g., continuing graduate education, employed at a public agency or private firm, etc.) and, where applicable, completed graduate degrees and awarding institutions.**
One graduate student is employed at a national engineering company in Milwaukee's office. One graduate student is employed at a national engineering company in Baton Rouge, Louisiana.	